

was evolved, a bird larger than the Savannah Sparrow of the main land, and of a gray or sandy, rather than a black and brown color, so that when it squatted in terror on the sand the sailing Hawk was more apt to pass it by.

It seems to me, therefore, that the evolution of the Ipswich Sparrow is comparatively recent, and that the age of this species may be counted by the paltry fifty thousand years or so that have elapsed since the last glacial period.

A RECONSIDERATION OF THE AMERICAN BLACK DUCKS WITH SPECIAL REFERENCE TO CERTAIN VARIATIONS.

BY JOHN C. PHILLIPS.

THERE are several species of primitive ducks which for many reasons are of peculiar interest, on account of their remarkable geographical distribution and mutual interrelationship. This group of species is composed of *Anas fulvigula*, *Anas tristis*, *Anas diazi*, *Anas wyvilliana* and *Anas laysanensis*. Most of these are poorly represented in collections and this fact has led to certain misconceptions. It is the purpose of the following notes to point out some of these mistakes, and to say a few words about individual and sexual variation.

To begin with I wish to call attention to the principal difficulty in the proper understanding of these local races; this is the presence of a sexual difference in plumage, increasing probably with age, and comparable, with that of the Hawaiian duck (*Anas wyvilliana*). In this way all these related species can be separated from *A. tristis* in which the sexes are similar. At first I thought that this sex difference was confined to *A. diazi* and I started to limit these notes to the latter species, but as more specimens turned up I thought it better to consider all the American Black Ducks.

In the autumn of 1910 Mr. W. W. Brown, Jr., collected some birds for me in the lake region near Mexico City. In the collection was a large series of *Anas diazi*, heretofore very rare in museums. There were six males and seventeen females, taken near Lerma in the early Fall.

Upon examining this series I was struck at once with the very marked sexual difference shown in the skins, a difference which does not appear to have been properly noticed. The species was first described (Ridgway, Auk, 1886, p. 332) from an immature female and then later by F. Ferrari-Perez (Pr. U. S. Nat. Mus., 1886, p. 127) from an adult male, as well as an immature female. In the latter paper the female was said to be very similar to the male except that the streaks of the lower parts were narrower. The sexual color differences of bills and legs were not noted.

It is at once apparent that this bird is widely different from the other American Black Ducks.

Sexual dimorphism. The most noteworthy sexual differences are as follows. The male is somewhat larger than the female, more especially in the wing measurement. The upper mandible of the male is colored a dull olive or yellow-olive, while that of the female is dusky along the center and brilliant orange on the sides. Conversely the feet and legs of the male are bright orange and those of the female a dull orange color. The under parts of the males are barred with irregular blackish V-shaped markings, while the females are all more or less finely streaked with a lighter dusky shade. This difference of appearance is due to a different feather pattern, particularly on the front and sides of the breast. (See plate.) The typical female feather has a dark central wedge at the tip, while the male feather is edged with brown and patterned with a V-shaped sub-terminal black area.

Individual variation. Both the anterior and posterior ends of the speculum are framed by a black band inside, and a light band outside. The posterior white band, formed by the tips of the outer secondaries is fairly uniform, but the anterior white band is very variable. In some cases it is narrower and mixed with buff or dusky; and in three cases it is absent altogether and replaced by a very faint dusky line. These last are all females. We see thus a tendency to vary in the same direction as will be pointed out

further on for *A. wyvilliana* and along the lines of what appears to be a distinctly Mallard character. In one specimen, Mus. Comp. Zoöl., No. 54135, the fifth secondary from the outside shows no metallic color. Its inner web is normal, while its outer is brown, dusky at the shaft, and light buff on the edge.

Taken as a whole this series appears very uniform in color and does not present the variety of appearances which is seen in *A. tristis*. In the latter the tips of the secondaries very often show a narrow white band, and occasionally a specimen is found that shows a white or whitish band at each end of the speculum, thus approaching the Mallard type.

The speculum color of *A. diazi* varies, as it does also in *A. platyrhynchos* and in *A. tristis*, from a metallic violaceous green to a violaceous purple. This difference has apparently nothing to do with age or sex and is not a character of specific importance, except within wide bounds. It seems to have been used too frequently in describing specific differences.

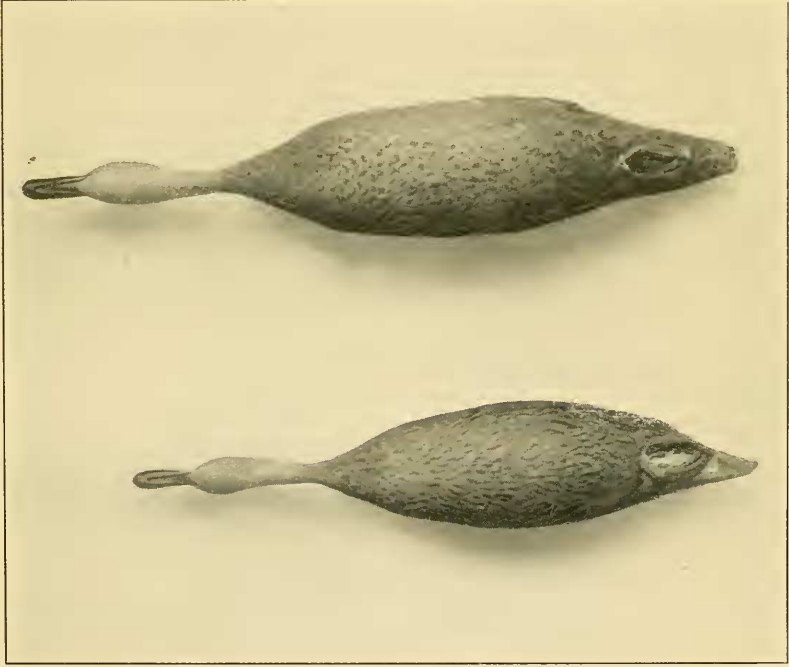
ANAS FULVIGULA — FLORIDA DUCK AND A. F. MACULOSA — MOTTLED OR TEXAN DUCK.

As originally described by Sennett (Auk, 1889, p. 263) the Texan form was separated from the true Florida Duck on the basis of several indefinite characters, which I should like to consider briefly. It is certainly a fact of peculiar interest if two races of Ducks could be found within such an area as the southeastern states where except for a very few exceptional cases the avifauna is so uniform.

In the British Museum Catalogue, Vol. XXVII, p. 203, Salvadori says, "In my opinion *A. maculosa* is scarcely different from *A. fulvigula*."

I have at hand a fine series of *A. maculosa*. There are 3 from the Museum of Comparative Zoölogy, 5 from the collection of Mr. John E. Thayer and 4 from the collection of Mr. Wm. Brewster. These have been carefully compared with a series of 7 Florida Ducks in the Museum of Comparative Zoölogy and 13 from Mr. Brewster's collection. I do not hesitate to say that as far as I can see there is no racial difference between these 12 specimens from

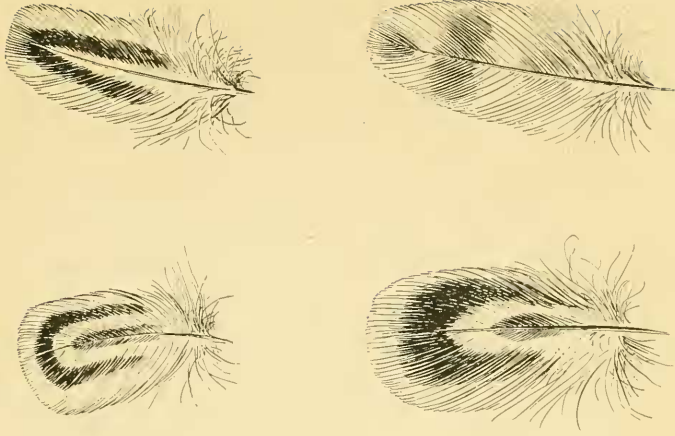
Texas and the 20 from Florida. There is also one Florida Duck in down in the Brewster series. In the original description of *A. fulvigula* (Ridgway, Pr. U. S. Nat. Mus., Vol. I, p. 251) nothing is said about sex dimorphism, yet this is apparent though perhaps not quite so uniform or so well marked as in *A. diazi*. Mr. Brewster's specimens are especially fine, being mostly birds in fresh plumage. There is a general tendency to a more mottled appearance in the males and a more streaked appearance in the females; the difference being particularly marked over the breast, where the males average very much darker. The different appearance of the under parts is due to a feather pattern similar in general to that found in *A. diazi* and *A. wyvilliana*. The typical male breast feather has a V-shaped black pattern tipped with brown, in unworn specimens, while the female has a more irregular black pattern extending to the tip as a median wedge-shaped area. The sexual difference is probably accentuated with age, and there is no trouble in picking out the adults of either sex at a glance. There is good evidence both here and in *A. diazi* that the immature feathers are of the female type, the typical male pattern first appearing on the upper chest, and later extending to the abdomen. Except in one case the dry bills of the Brewster series are all dull orange in the female and dark olive in the male. This one exception is a black bill in an undoubted female specimen. There is no tendency in any of the males to sex feathers in the tail. The speculum varies from a brilliant green to a brilliant purple. There is no trace of an anterior white speculum band, but a posterior white one often occurs. The chin color varies from cream white to pale rufous and no specimen shows a rufous chin. The male birds are somewhat darker throughout than are the females. The young in down (one specimen), has a distinctly pale appearance compared with the young of *A. tristis*. It is brownish in appearance rather than dusky. Bearing these facts in mind and turning now to *A. fulvigula maculosa* we find this Texan and Mexican race separated from the Florida race by Sennett with the following characters. Color of the cheeks more brown than in *A. fulvigula* (streaked with brown according to Sennett, but I cannot see what is meant by this). It is probable that the Texan birds were thought to have more richly colored chins. The speculum is said to be purple instead



Female on left.

Male on right.

ANAS DIAZI.



BREAST FEATHERS, ENLARGED.

ANAS WYVILLIANA (above).

ANAS DIAZI (below).

Male on left.

Female on right.

of green, while the general color of the under parts is mottled instead of streaked. The light color of the margins of the tail feathers is said to be different, as are the lighter parts of the plumage in general.

As to the color of the cheeks there is no difference in the markings themselves, or in the ground color. It is true that in specimen No. 4562, M. C. Z., from Brownsville the ground color of the chin is rather darker than any Florida specimens which I have seen. The bird as a whole is very dark, having the appearance of being stained during life. As to the speculum color it varies so much, as was shown above that I cannot consider it very seriously. In Mr. Brewster's specimens from Texas the color was purplish green, and in the other specimens there was quite a range of shading from purplish green to a nearly pure purple. The direction of the light, must of course be taken into consideration in judging speculum colors. As to the general color of the under parts it would seem that an adult male Texan bird was being compared by Sennett with a female or immature male from Florida. The general color of the feather margins does not show any difference in the two regions. As to size, over 70 separate measurements have been carefully taken and averaged, and they show absolutely no difference. They do show this, however, that the Florida and Texas birds differ slightly from *A. diazi*. The culmen in *A. diazi* is shorter, while the tarsus and wing are slightly longer. A somewhat careful consideration, then, has given no proof of two races of *A. fulvigula*.

ANAS TRISTIS—BLACK DUCK.

It is not the purpose of this paper to discuss the question of two forms of this species.¹ Neither material nor experimental proof is at hand. It is, however, very interesting to look at a mixed series of *A. tristis* and compare it in a general way with *A. diazi* or *A. fulvigula*. In the former species there is a diversity in general shade and markings, especially on the lower parts, which is very curious in such stable birds as the Anatidæ. It suggests that we are dealing with a 'mixed population', the term being used here

¹ *A. rubripes* and *A. rubripes tristis*.

in a genetic sense. There is certainly evidence of two forms, but unfortunately some of the characters form a graded scale, and are well defined only in male birds, perhaps only in old males.

There are however, other interesting variations in *A. tristis*, such as the irregular occurrence of characters that are essentially Mallard. I mean here variations that occur outside of the rather common hybrids with the Mallard. Such variations occur in a large number of full plumaged male birds. I paid some attention to these variations a few years ago and was surprised to find in perhaps 20 to 30 per cent. of male birds taken in late fall in Massachusetts, some of the following abnormalities. One or more brilliant metallic green feathers on the pileum; a general metallic cast to the feathers of the upper parts, especially the rump; the upbending of the central tail feathers, sometimes to quite a marked extent; and the very much darker appearance of the chest in contrast to the abdomen, so that a demarcation line was more or less apparent, corresponding to the lower edge of the chestnut in the Mallard. Also, as was before noted the posterior end of the speculum may be banded with white, and occasionally both ends are framed by a narrow white band. These characters may appear singly or several of them in combination.

If they signified a slight infusion of Mallard blood we should certainly expect to find some sort of corresponding variation in the Mallard. Such, however, is not the case. Aside from well marked hybrids, the Mallard presents no evidence of contamination. We must, therefore, regard these variations as slight Mallard tendencies which are being carried along by the species, for the most part in a latent or inhibited condition.

In examining some pure wild male Black Ducks which I have had in captivity for three years I was much struck with the large amount of green which had appeared in the postocular stripe and along the sides of the pileum. Their rumps were brilliant bronze with iridescent green reflection. There has certainly been a change in these birds in three years, but I have no exact notes. I have never seen so much green in any wild killed Black Ducks as one of these captive ducks shows.

The occurrence of such variation makes the problem of a possible bi-racial composition of *A. tristis* even more difficult. I hope to

be able soon to obtain experimental proof either for or against the presence of latent Mallard characters in *A. tristis*.

ANAS WYVILLIANA — HAWAIIAN DUCK.

This duck is considered here because of its undoubted relationship to the American Black Ducks, and on account of its curious variations, which have already received comments from several writers. I hope to show that, as in the case of the Florida Duck, a certain amount of misconception has arisen because of a failure to understand the sex plumages. There are other matters, however, that cannot be disposed of so easily and which must be taken up in some detail. The U. S. National Museum has kindly loaned seven specimens of this very rare duck, and the three others studied belong to the Museum of Comparative Zoölogy. The species is now either extinct, or bordering closely upon it.

The Hawaiian duck is very interesting also, because it shows direct Mallard affinities, and is the only other species except the Laysan Teal (*Anas laysanensis*) that normally carries the Mallard sex feathers in the tail. Its individual variation is all the more curious when found in a group as stable as the Anatidæ, especially when confined to an insular habitat.

Anas wyvilliana was first described, with a short diagnosis, by Sclater in 1878 (P. Z. S. 1878, p. 250) but there was nothing to show to which sex the specimens belonged, except the mark of the collector, who recorded them as males. In the Voyage of the Challenger (Birds, Plate XXII) Sclater figures one of these males, which is apparently in juvenile plumage or perhaps in summer moult.

In 1888, Stejneger (Pr. U. S. Nat. Mus., Vol. II, p. 98) calls attention to the defects in the original description and in the plate, and then deals at some length with the various differences found among the five specimens then at hand in the U. S. Nat. Museum. Other remarks were made about this species by T. Salvadori (in the British Museum Catalogue, Vol. XXVII, p. 196, 1895) who also considered this bird more or less of an ornithological puzzle.

Rothschild in the 'Avifauna of Laysan,' 1900, p. 271, gives two plates of *A. wyvilliana* and discusses his large series of specimens.

First let us glance briefly at the ten specimens before us and in a general way give the main points of sexual difference. Of the six males, four are correctly sexed, one is unsexed, and one has been sexed both as a male and a female and then had both marks crossed out. There is, however, no question about the sex of either of these two. All six males present the characteristic V-shaped markings on the breast (see plate) thickly streaked throat and cheeks, nearly black pileum, sometimes mixed with iridescent green towards the neck; and except in one case evidence of sex feathers in the tail. In this one case (Nat. Mus. No. 113448) the middle tail feathers are lacking, probably moulted out as the date is May. The sex feathers appear to be typically three in number, but they may be four. They are not so well developed as in the Mallard.

Of the four females all are correctly sexed. They all have the streaked under parts characteristic of *A. diazi* (see plate), immaculate throats and absence of sex feathers.

The table of measurements below shows the size difference in the two sexes. This is small and about comparable with that seen in *A. diazi*.

Males.

	No. 113447						
	U. S. Nat.	113449	131717	113448	21319	15025	
	Mus.	do.	do.	do.	do.	M. C. Z.	Av.
Culmen	44	44	45	48	44	46	45
Wing	230	218	223	228	218	212	221
Tarsus	37	39	39	40	39	38	39

Females.

	<i>A. aberti</i>					
	Type 12788					
	U. S. Nat.	113450	131718	48384	48383	
	Mus.	do.	do.	M. C. Z.	M. C. Z.	Av.
Culmen	42	44	41	44	45	43
Wing	212	210	206	215	219	212
Tarsus	35	38	38	38	41	38

We must now turn to Dr. Stejneger's account of the species. He first describes the two males, U. S. N. M., No. 113447 and No. 113449, and shows several points of difference between them, especially in the color of the bill, in the anterior white wing band and in the under wing-coverts and under tail-coverts.

No. 113448 was taken to be a female (absence of sex feathers noted above) although the specimen is without doubt a male, as evidenced by the characteristic breast pattern, large size, and dark chin. The smaller upper wing-coverts are broadly margined with cinnamon in this specimen, a character also seen especially well in No. 131718 and in the type of *A. aberti*. This certainly looks, as Stejneger himself suggests, like a youthful type of plumage for the males of more advanced plumage show the small wing-coverts plain drab, slightly edged with white.

Of the other two specimens described as females, No. 21319 is a typical male, and this leads to a misunderstanding. The only female then, which Dr. Stejneger had was No. 113450. He mentions among true individual differences, the curious white ring around the eye in one specimen, the transposition of the white anterior wing-bar, the coloring of the lining of the wing, etc. These will be referred to again.

Salvadori, 1895, confesses that he does not understand the species. He thinks that domesticated mallards might have become feral and influenced *A. wyvilliana*. This seems to me to be not at all probable because of the small size of the species and its perfect uniformity as to measurements. Salvadori calls attention to the characters that distinguish the adult males and shows that young birds resemble adult females.

Rothschild, 1900, in two fine plates shows well the Mallard affinities of the species. His series is a large one and especially interesting are the few white flank feathers finely undulated with blackish brown which, together with the faint cross-barring on the abdomen occur only in his oldest males.

This series shows nothing of this sort and it is therefore probable, as suggested by Rothschild, that final male plumage is not obtained for several years. He picks out his younger males by the presence of spotted abdomen and absence of curled retrices, but this diagnosis would not hold in the series at hand, as will be seen in the above description of the males.

Rothschild calls attention to variability, which he considers greater in the female. In some of his female specimens white tips were present on the coverts which form the anterior edge of the speculum. The different appearance of the under wing-coverts

in his specimens is a form of variation which along with some others he says he cannot account for.

Aside, then, from certain other curious variations, we have in this species male birds with Mallard affinities readily distinguished from the females, a juvenile plumage like the females (Rothschild) very likely a partial eclipse plumage,— in which the males lose some of their characteristics,— and almost certainly some changes due to age. The lack of accurate dates makes any assumptions on this last point merely guesswork. A good deal of the difference in color of the lower parts in this series is, I believe, due to staining during life.¹

I should like to point out what is at once the most noticeable variation, and one that is certainly separated from any question of age. This has to do with speculum bars.

In the males the first band anterior to the speculum is always black, but next to this there is a wide range of color difference. In one case there is a broad white band, in two cases a narrow white band, in two other cases a very indistinct buffy band, and in one case no band other than the black one, which here is very finely tipped with whitish.

In the females (*A. aberti* included) the anterior margin of the speculum is, in four specimens, bordered by a black band formed by black tipped greater coverts, next comes a band of buff color which shows a marked variation. In one case it is almost indistinguishable, while in three cases it varies from a very light buff to a russet color. In the fifth case, No. 113450, as Dr. Stejneger has described, the normal white bar is replaced by a grey one, while a new bar of pure white is interposed between the black bar and the speculum, an arrangement entirely unique and non-mallard like. The posterior end of the speculum appears to be always uniform, it is bordered by two bars, an inner black and an outer white. Thus we see a general tendency to variation anterior to the speculum, as was previously pointed out for *A. diazi*. There are several other minor points of interest about *A. wyvilliana*, one of which is a slight tendency to albinism in at least three specimens.

¹ cf. Wilson Bulletin, XXI, p. 221.